

## Module Description

### MA3703: Fixed Income Markets

#### TUM Department of Mathematics

<b>Module level:</b> Master	<b>Language:</b> English	<b>Module duration:</b> one semester	<b>Occurrence:</b> winter semester
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<b>Credits*:</b> 5	<b>Total number of hours:</b> 150	<b>Self-study hours:</b> 105	<b>Contact hours:</b> 45
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\* The number of credits can vary depending on the corresponding SPO version. The valid number is always indicated on the Transcript of Records or the Performance Record.

#### Description of achievement and assessment methods:

The module examination is based on a written exam (60 minutes). It is examined how deep students understand the theoretical fundamentals of term structure models, whether they can price interest rate derivatives and measure as well as control interest rate risks.

<b>Exam type:</b> written	<b>Exam duration (min.):</b> 60	<b>Possibility of re-taking:</b> In the next semester: No At the end of the semester: Yes	<b>Homework:</b> No
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<b>Lecture:</b> No	<b>Conversation:</b> No	<b>Written paper:</b> No
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#### (Recommended) requirements:

MA4405 Stochastic Analysis, MA3702 Continuous Time Finance

#### Contents:

Coupon Bonds, Forward Agreements on Coupon Bonds, Modeling of Fixed Income Markets, Pricing of Contingent Claims, Short-Rate Models, Heath-Jarrow-Morton Framework, Multi-Factor Models, LIBOR Market Model, Interest-Rate Derivates (Futures, Swaps, Caps, Floors, Options), Management of Interest Rate Risk.

#### Study goals:

At the end of the module students are able to understand the fundamentals of Fixed Income Markets. They are able to evaluate interest rate derivatives, and manage interest rate risk.

#### Teaching and learning methods:

The module consists of the lecture supplemented by an exercise session. The lecture material is presented with slide presentations and mathematical proofs are presented on the blackboard. The students are encouraged to study course references and course subjects. The exercise session consists of theoretical and computer-oriented exercises. In the theoretical exercises students will work under instructor assistance on assignments, sometimes in teamwork. The exercises contribute to a better understanding of the lecture materials.

#### Media formats:

blackboard, assignments

#### Literature:

R.Zagst: Interest Rate Management, Springer Finance, 2002.

D. Brigo and F. Mercurio: Interest-Rate Models: Theory and Practice, Springer Finance, 2005.

J.C. Hull: Options, Futures and Other Derivatives, Prentice-Hall, 2008.

M. Musiela and M. Rutkowski: Martingale Methods in Financial Modelling, Vol. 36, Springer, 2005.

R. Rebonato: Interest-Rate Option Models, John Wiley & Sons, 1998.

R. Rebonato: Modern Pricing of Interest-Rate Derivatives: The LIBOR Market Model and Beyond, Princeton University Press, 2002.

D. Filipovic: "Term-Structure Models", Springer Finance, 2009.

**Responsible for the module:**

Zagst, Rudi; Prof. Dr.: [zagst@tum.de](mailto:zagst@tum.de)

**Courses (Type, SH) Lecturer:**

0000002191 Fixed Income Markets (2SWS L, WS 2016/17)

Linders D [L], Zagst R

0000002192 Fixed Income Markets (Exercise Session) (1SWS P, WS 2016/17)

Zagst R, Linders D

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For further information about this module and its allocation to the curriculum see:

<https://campus.tum.de/tumonline/wbModHb.wbShowMHBReadOnly?pKnotenNr=478039>

Generated on: 13.07.2017 13:14